

C L A I M S

1. A fault searching method for an optical line which searches for a fault in an optical line connected with an optical fiber carrying out data transmission
5 between from a transmission apparatus at a center station side via an optical divider such as a passive optical network (PON) up to a user optical terminal comprising:

preparing an optical time domain reflectometer
10 (OTDR) which carries out a test for the optical fiber based on backward scattering light or return light from the optical fiber by making test light be incident into the optical fiber;

detaching a terminal portion of the optical line
15 at an inside of the user optical terminal from the inside of the user optical terminal, and connecting the OTDR to the terminal portion of the optical line;

making at least one of test light with a wavelength different from a wavelength of light used
20 for data transmission in the optical line, and test light whose peak level is less than or equal to a predetermined level be incident upon the terminal portion of the optical line from the OTDR; and

searching for a fault in the optical line from the
25 user optical terminal side by detecting backward scattering light or return light from the optical line which is obtained based on the incidence of the test

light by the OTDR.

2. A fault searching method for an optical line, according to claim 1, wherein

the wavelength of the test light is a wavelength
5 different from the wavelength of the light used for data transmission in the optical line, and is a wavelength different from a wavelength used for a test for the optical line from the center station side.

3. A fault searching method for an optical line,
10 according to claim 2, wherein

the wavelength of the test light is a value included in one of ranges being greater than or equal to 0.3 μm and less than 1.3 μm , or greater than 1.65 μm and less than or equal to 2.0 μm .

4. A fault searching method for an optical line,
15 according to claim 3, wherein

the wavelength of the test light is a value approximately 0.6 μm .

5. A fault searching method for an optical line,
20 according to claim 4, wherein

when the wavelength of the test light is the value approximately 0.6 μm , an Si photodetector which indicates light receiving sensitivity in the wavelength band approximately 0.6 μm , and which hardly indicates
25 light receiving sensitivity with respect to data transmission lights with wavelengths of 1.31 μm and 1.55 μm which are used for data transmission is used as

a light receiver of the OTDR.

6. A fault searching method for an optical line, according to claim 1, wherein

5 the test light whose peak level is less than or equal to the predetermined level is set such that the peak level is made to be -40 dBm through -50 dBm or less as a signal level of the test light at other user optical terminals or a light receiving portion of the transmission apparatus at the center side.

10 7. A fault searching system for an optical line which searches for a fault in an optical line connected with an optical fiber carrying out data transmission between from a transmission apparatus at a center station side via an optical divider such as a passive
15 optical network (PON) up to a user optical terminal comprising:

an optical time domain reflectometer (OTDR) which carries out a test for the optical fiber based on backward scattering light or return light from the
20 optical fiber by making test light be incident into the optical fiber;

means for detaching a terminal portion of the optical line at an inside of the user optical terminal from the inside of the user optical terminal, and for
25 connecting the OTDR to the terminal portion of the optical line;

means for making at least one of test light with

a wavelength different from a wavelength of light used for data transmission in the optical line, and test light whose peak level is less than or equal to a predetermined level be incident upon the terminal portion of the optical line from the OTDR; and

5 means for searching for a fault in the optical line from the user optical terminal side by detecting backward scattering light or return light from the optical line which is obtained based on the incidence of the test light by the OTDR.

10 8. A fault searching system for an optical line, according to claim 7, wherein

the wavelength of the test light is a wavelength different from the wavelength of the light used for data transmission in the optical line, and is a wavelength different from a wavelength used for a test for the optical line from the center station side.

15 9. A fault searching system for an optical line, according to claim 8, wherein

20 the wavelength of the test light is a value included in one of ranges being greater than or equal to 0.3 μm and less than 1.3 μm , or greater than 1.65 μm and less than or equal to 2.0 μm .

25 10. A fault searching system for an optical line, according to claim 9, wherein

the wavelength of the test light is a value approximately 0.6 μm .

11. A fault searching system for an optical line,
according to claim 10, wherein

when the wavelength of the test light is the value
approximately 0.6 μm , an Si photodetector which
5 indicates light receiving sensitivity in the wavelength
band approximately 0.6 μm , and which hardly indicates
light receiving sensitivity with respect to data
transmission lights with wavelengths of 1.31 μm and
1.55 μm which are used for data transmission is used as
10 a light receiver of the OTDR.

12. A fault searching system for an optical line,
according to claim 7, wherein

the test light whose peak level is less than or
equal to the predetermined level is set such that the
15 peak level is made to be -40 dBm through -50 dBm or
less as a signal level of the test light at other user
optical terminals or a light receiving portion of the
transmission apparatus at the center side.